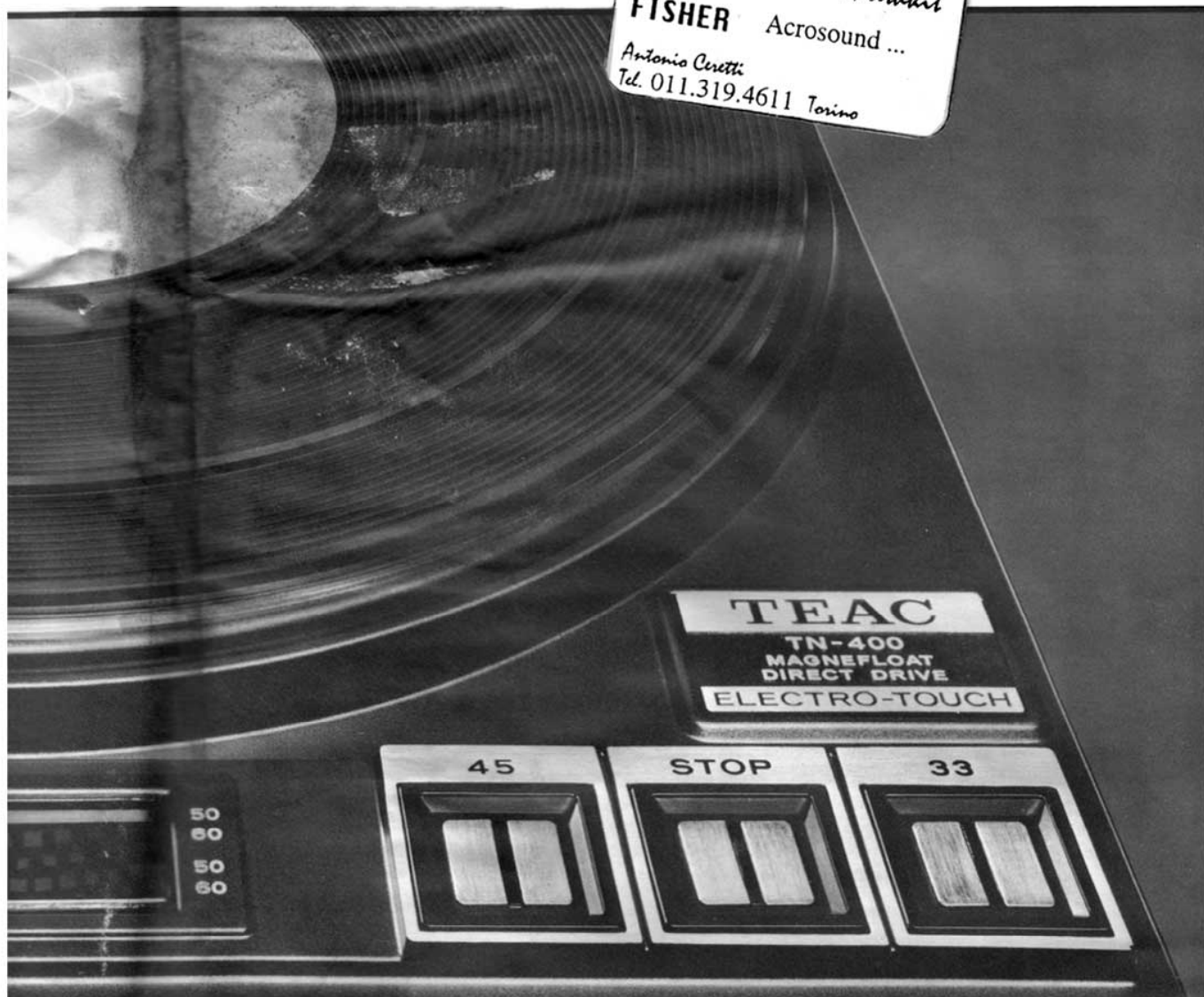


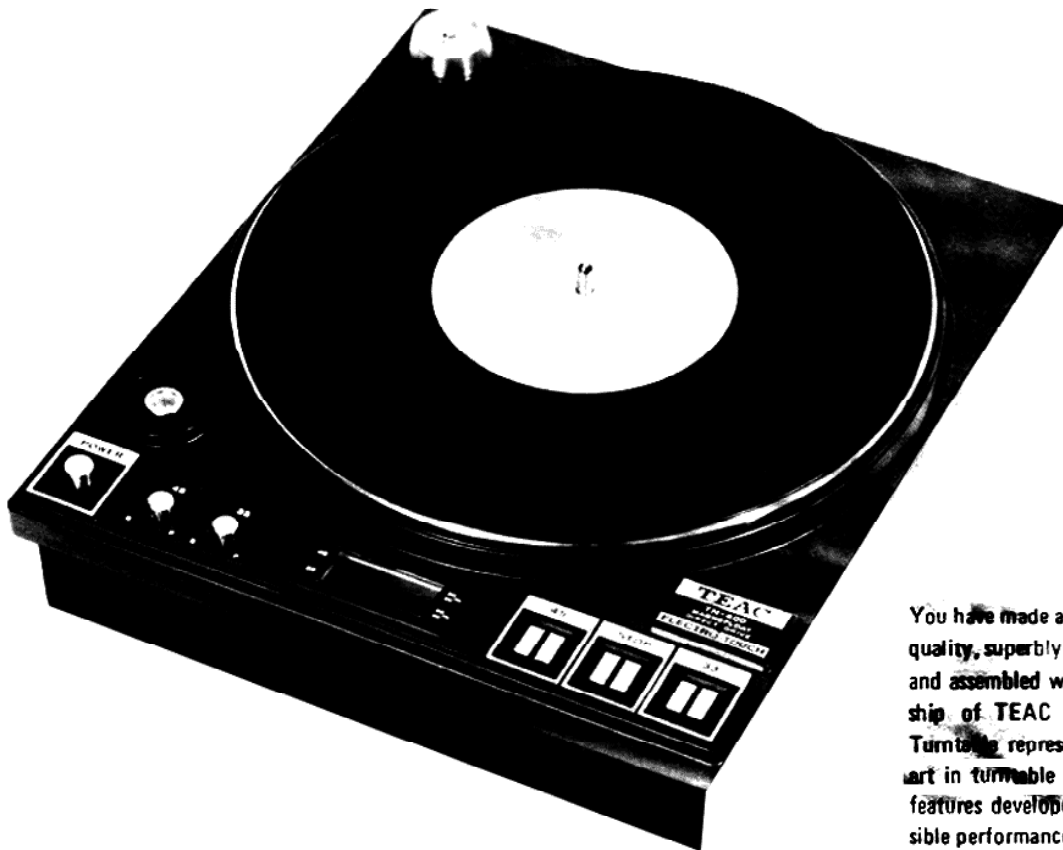
# OWNER'S MANUAL



## TEAC<sup>®</sup> TN-400 Direct Drive Turntable



# Introduction



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You have made a sound investment in a high quality, superbly designed turntable, created and assembled with pride by the craftsmanship of TEAC Corporation. The TN-400 Turntable represents the finest state-of-the-art in turntable design, with several unique features developed to assure the finest possible performance.

Before placing the TN-400 into operation, we strongly urge you to read and completely understand the contents of this Manual. While operation is exceptionally easy, the unit itself must be assembled with care using the procedures described. Also, complete understanding of the unique design features will increase your enjoyment and appreciation of the TN-400.

**Original condition:** this turntable unit was designed and engineered with precision to assure a long, trouble-free lifetime of use. Each of many points was thoroughly checked and inspected at the factory. Should any damage have been incurred during transit or should you have any doubts about the unit's performance, contact your TEAC dealer as soon as possible.

**WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.**

## Features

### Superior Signal-to-Noise ratio

Possible sources of undesirable noise and rumble include the Power Transformer, the Drive System, the Turntable Bearing System and the Motor. TEAC has dramatically reduced rumble (and other noise) in the TN-400 to less than 60 dB by special concentration on those areas.

- The power transformer has a double-cushioned mounting. It is completely shielded and pitched to reduce hum and vibration.
- The direct-drive system employed has the DC servo motor connected directly to the turntable platter. This completely eliminates friction and vibration from belts, gears, and pulleys which are not used in the TN-400.
- MAGNE-FLOAT is a unique application of magnetic repulsion employed to reduce the effective weight of the heavy platter. This partial suspension by a constant magnetic field reduces friction (and thus rumble) at the pivot point on the platter/motor shaft.
- The ultra-low-speed DC servomotor is completely brushless, using a quiet electronic commutator. Electronically quiet, the motor also has very little vibration as it is directly coupled to the massive 2.4 kg (5 1/4 lb.) turntable platter.

### Only one moving part

Mechanical problems are almost impossible with the TN-400 as only the Direct-Drive Motor/Platter assembly is moving. No idlers to wear out, no gears to grease, no levers and no belt to replace means a long and stable operating life. Even the turntable support bearing (self-lubricating) has a reduced wear factor for the "MAGNE-FLOAT" system lifts 0.6 kg (about 1 1/3 lb.) of the platter weight up from the pivot point.

### Greatly reduced 0.03% wow and flutter

The incredible TEAC DC servomotor was designed for reduced wow & flutter by incorporating 20-pole rotor-magnet/60-slot stator cores, a 3-phase governing system, and assuring a highly-regulated DC voltage to the motor. Direct contact between the motor and the massive die-cast aluminum platter (with its inertia-mass of 325 kg-cm<sup>2</sup>) practically eliminates any fluctuations in the motor. The platter is dynamically balanced at TEAC's factory, also contributing to the very undetectable 0.03% wow & flutter characteristic.

### "ELECTRO-TOUCH" control center

Lightly touch the surface of the sensitive switches to start the turntable at the selected speed, 33 or 45 rpm. Another touch to the STOP "switch" will electronically command the motor to cease its drive.

With no moving parts, these ELECTRO-TOUCH switches are unique in the industry, for they are activated without any thump or vibration to upset the smooth performance of the TN-400.

### Special power supply design

An automatic drive-current selection and governing method is used with a large, cutcore transformer to prevent a decrease in voltage when the motor starts. To bring the rotation quickly up to rated speed requires up to 8 times the normal current which means a surge current of almost 800 mA is provided without a decrease in the DC voltage. Motor stability is further supported by an extremely well regulated DC power supply circuit which delivers 21 volts + or - only 0.1 volt for an outstanding  $\pm 0.5\%$  tolerance factor. The TN-400 is not dependent upon the AC voltage frequency and may thus be used with either 50 or 60 Hz power sources. Separate controls for each frequency are provided in the stroboscopic speed adjustment system; use the appropriate control and the correct band on the indicator for precise adjustment to the rated speed.

### Stylus overhang scale

Stylus overhang adjustment can be checked quickly by the accurate concentric grooves etched directly onto the turntable platter. Both 10 mm and 15 mm radius marks are provided.

## About Warranty & Service

### WARRANTY REGISTRATION

To validate your warranty for this unit, fill in the Warranty Registration and return it to TEAC Corporation immediately. Retain your Bill of Sale, keep it in a safe place, for you may need it to verify the purchase date for your warranty. Also keep the box and packing materials. If the unit ever needs be returned to a Service Station you will be responsible for shipping damage if incurred because of improper packing by you.

### SERVICE

Should the equipment need repair, contact the dealer where it was purchased, or the authorized TEAC Service Station nearest you. For an up-to-date listing of the Service Stations, write to TEAC; both address and phone number are on the back cover.

\* The Warranty period is described on the Warranty Card. Read the card for complete details.

\* For repairs after expiration of the Warranty period, a service charge will be required, please contact the nearest authorized TEAC Service Station.

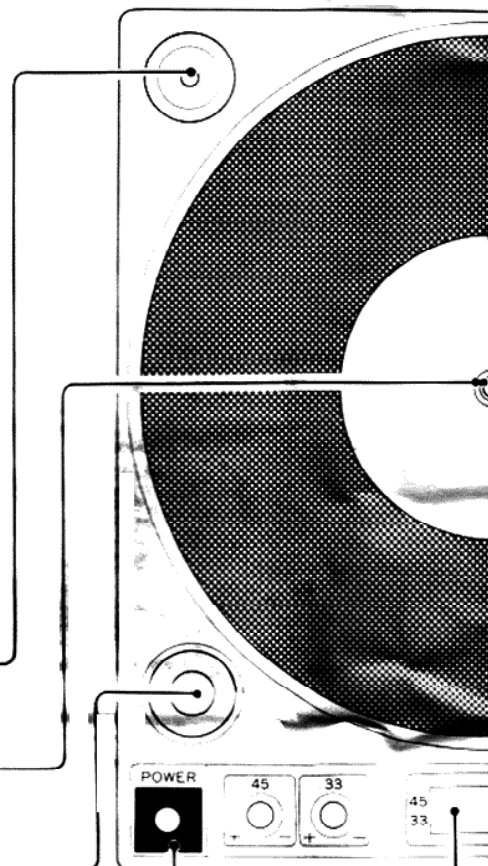
IMPORTANT: Although the unit may still be under the Warranty Period, you are liable for repairs made necessary by abuse or improper operation of the unit.

### Specification

<b>Drive System</b>	Direct drive
<b>Motor</b>	20-pole, 60-slot, ultra-low speed DC servo motor
<b>Turntable</b>	30 cm (12") diam. die-cast aluminum weight: 2.4 kg, inertial mass: 325 kg-cm <sup>2</sup>
<b>Speeds</b>	33-1/3 and 45 rpm
<b>Speed Selector</b>	Electronic selector system with ELECTRO-TOUCH switches
<b>Speed Adjustment</b>	±4% from rated speed
<b>Start Characteristics</b>	Within 3/4 revolution at 33-1/3 rpm
<b>Wow and Flutter</b>	0.03% (wrms)
<b>Signal to Noise Ratio</b>	60 dB
<b>Power Requirement</b>	240V AC, 50Hz, 15W
<b>Dimensions</b>	4-3/4" (H) × 12-3/4" (W) × 14-5/8" (D) [121(H) × 324(W) × 370(D) mm]
<b>Weight</b>	18-5/8 lbs [8.5 kg] net

**Standard Accessories** 45 rpm center adaptor, Silicone cloth, Mounting screws set.

- \* Feature and specifications subject to change without notice.
- \* Photographs and/or illustrations may differ slightly from the appearance of your unit when production design improvements are incorporated.



**45 rpm SPINDLE ADAPTOR**

**STYLUS OVERHANG SCALES**  
Inner scale radius = 10 mm  
Outer scale radius = 15 mm

**BUBBLE SCALE** for azimuth balance.

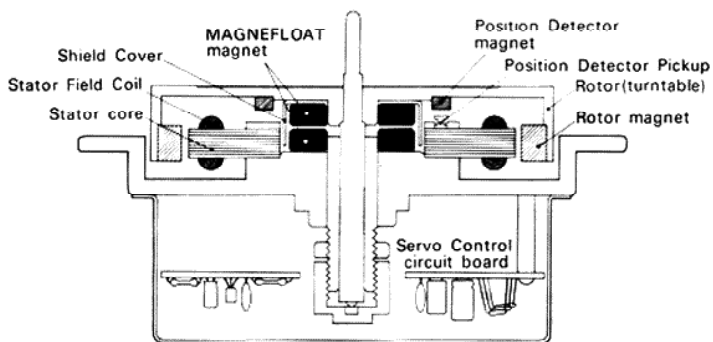
**POWER SWITCH**

### SPEED CONTROL FINE ADJUSTMENT KNOBS

Adjust for accurate turntable speed while observing the stroboscope indicator. ±4% variation is provided.

### STROBOSCOPE SPEED INDICATOR

Four bands of marks are illuminated under the window by neon lamps. When speed is accurate, the appropriate band appears to stop moving.



**SECTIONAL VIEW OF THE DRIVE MOTOR AREA**

## Operation

Connect the AC power cord to the mains outlet.

Depress the POWER switch to ON. Stroboscope lamps and the STOP lamp will illuminate.

Lightly touch the 33 or 45 Selector Control as appropriate. Lamp for the control selected will illuminate and the platter will begin rotation.

Check the stroboscopic Speed Indicator. If the band of marks for the established speed does not seem to be moving, the turntable speed is accurate. If it is moving or drifting, adjust for accuracy as explained below.

### ELECTRO-TOUCH CONTROL CENTER

Start/Speed and STOP switches.

Lightly touching the "33" or "45" control starts rotation at the selected speed. The ball of the finger must bridge both anodes of a control. These "switches" will not move. Lamps indicate the selected speed.

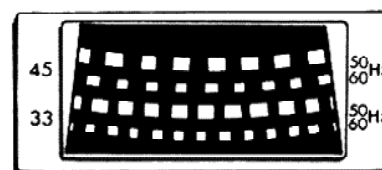
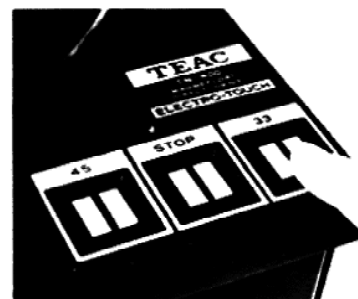
**Note:** The high inertial mass of the platter prevents it from quickly slowing down to stop. Upon touching the STOP control, the lamp will illuminate, but the platter will normally take several moments to slow to a stop.

**Notice:** In dry climates or when the relative humidity is very low, one might experience a moderate static-electricity discharge when touching the switches or other metal parts of the turntable. This results from the grounded condition of the chassis and is quite normal, not a fault in the TN-400.

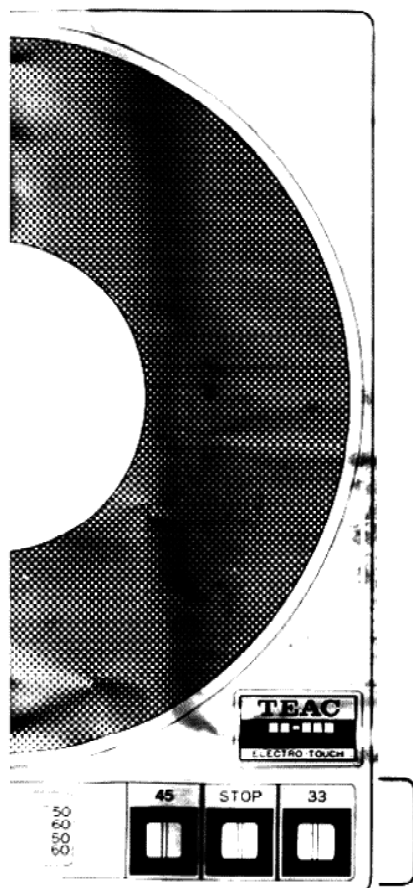
### Adjusting the speed

While the turntable is rotating, check the train for the speed selected. At the exact rotation speed, the marks in the band will appear to be stationary. If they are moving or drifting, the rotation speed can be corrected as follows:

Using the speed control knob for the selected speed (33 or 45), turn the knob clockwise (towards the -) if the strobe train is moving forward; counterclockwise (towards the +) if the marks are moving backwards. Move the knob slowly to allow time for the turntable to correct its speed.



**Note:** The reference used for reading the stroboscope is the 50 or 60 Hz power line frequency. While usually extremely stable, that reference has been known to vary up to 0.2%. Such variations will not effect the speed of the motor, but they might cause the Stroboscopic Indicator to deviate slightly. Such periodic deviations should be assumed to be from the power line variations, causing changes in the lighting.



### Stroboscopic indicator

Four bands of marks are imprinted around the platter. These are illuminated by two neon lamps and the image is reflected to the viewing window by a mirror system. The upper two trains are for 45 rpm, with the lower two for 33 1/3 rpm. Each speed group has a thicker band for 50 Hz and a thinner band for 60 Hz. Only the trains that correspond with your AC power line frequency should be used.

**Note:** Speed adjustment is not always essential for general operation; this feature is provided for the critical listener to assure the highest possible accuracy.

## Mounting procedures

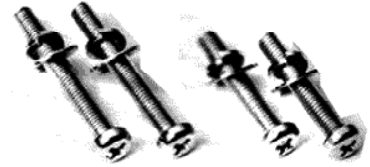
### Assembly & mounting procedures

Remove each container and packing piece one at a time from the top down through the carton.

If a pre-cut mounting cabinet is not available, or for custom mounting on a 5/8 - 3/4 inch thick board use the enclosed template.

\* Place the turntable onto the board and install the 4 bolts from the accessories bag with washers and nuts affixed below the turntable.

**Note:** Two sizes of bolts are provided; use the 3/4" bolt with boards thinner than 5/8"; 1" bolts are for boards over 5/8" thick (30mm and 40mm -long).



\* Remove the four double L-bent transit retaining lugs from the servomotor rotor. (Keep this hardware to protect the motor during future shipping).

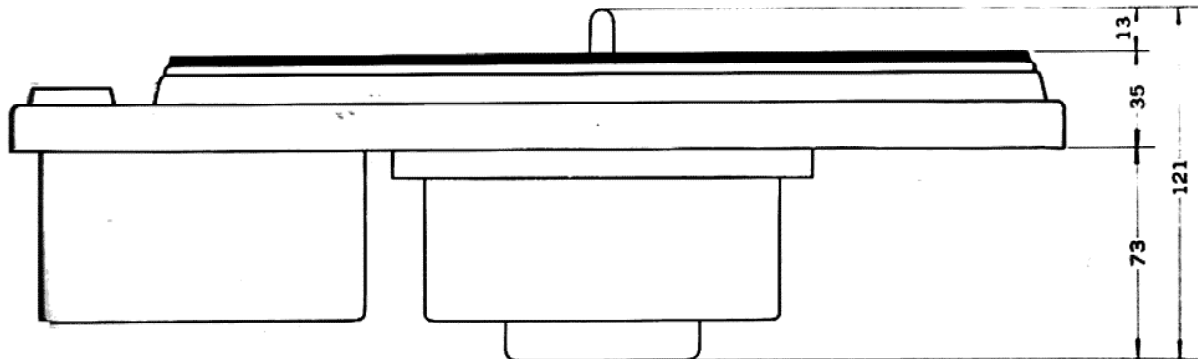


\* Gently place the turntable platter over the motor rotor, holding the platter with two hands, fingers in the holes. Place the rubber mat onto the platter.

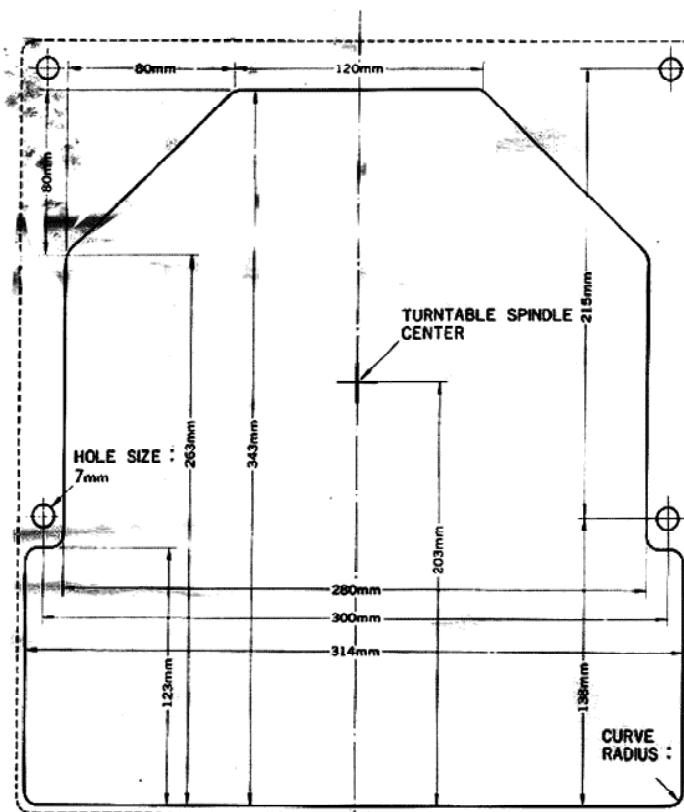
**Caution:** Never place the POWER switch ON unless the turntable platter is in place. The motor is designed for operation only with the turntable mounted.



## Dimensions



## TEMPLATE



**\*\* All dimensions (each size) are in millimeters.**

**\*\* Full size template is enclosed in the Standard Accessories Bag.**

**\*\* The pitch of the bolt & nut shown is based on ISO Standard.**



# TN-400 Direct Drive Turntable

# TEAC<sup>®</sup>

The leader. Always has been.

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